THE ALBERTA BEEKEEPING INDUSTRY
ADVISORY COMMITTEE

BACKGROUND REPORT AND RECOMMENDATIONS

March 1990
Chairman Walter Paszkowski

90-07278/

LEGISLATIVE ASSEMBLY
ALBERTA

WALTER PASZKOWSKI, M.L.A.
SMOKY RIVER CONTITUENCY

EDMONTON, ALBERTA
March 27, 1990

Honourable Ernie Isley
Minister of Agriculture
131 - Legislature Building
Edmonton, Alberta
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Dear Mr. Isley:

The undersigned has the honor to transmit herewith the Background Report and Recommendations of the Ministerial Advisory Committee on the Alberta Beekeeping Industry.

Respectfully submitted,

Walter Paszkowski

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EXECUTIVE SUMMARY

Alberta's commercial beekeepers produce over one-quarter of Canada's honey and much of its honey exports. Over the last several years this industry has experienced severe stress from economic and production-related factors.

One of the primary factors is a ban on importation of beestock from the U.S., imposed because of the discovery of the varroa mite in honeybees in the U.S. Originally imposed in the fall of 1987, this ban is still in effect and has resulted in difficulty of obtaining good quality beestock, particularly honeybee queens in early spring, when they are most needed.

Low honey prices and high sugar prices have coincided with these events and together have caused some beekeepers to leave the industry and others to curtail production. As an increasing amount of beekeeping equipment has been idle, its value has decreased and the availability of operating credit to producers, which is based largely on this asset, has diminished.

The occurrence of these difficulties and the downward trend in number of producers and colonies is most marked in the Peace River area, where the beekeeping industry is the most commercialized. Honey production in the province went from 11,600 tonnes in 1987 to 7,700 tonnes in 1989.

Several short-term government programs have addressed economic problems of the industry. Nevertheless, long-term solutions remain to be found for the industry as a whole. A comprehensive program which provides a safety net may be required to reduce the risks inherent to this industry.

Market development offers another means by which the industry may become self-reliant. Many opportunities for market expansion exist, primarily in the direction of new product and value-added product development, expansion of overseas markets, and specialty markets. A sound marketing strategy is needed.

Difficulties with the detection and control of parasitic mites in honeybee colonies are also hurting the industry. Tracheal mites, already present in honeybees in many parts of Canada and Alberta, are difficult to detect at economically controllable levels. Registration of chemicals for controlling mites has not been pursued in Canada.

Recommendations made to solve some of these problems include allowing the controlled importation of honeybee queens from Hawaii, addressing honey subsidies in the U.S. and Europe, expediting the registration of control chemicals for mites, and establishing a check-off system to obtain funds for marketing of honey and research and development.

RECOMMENDATIONS

A. PRODUCTION

The Committee recommends that:

1. THE MINISTER SUPPORT THE CONTROLLED IMPORTATION OF HONEYBEE QUEENS FROM HAWAII. AGRICULTURE CANADA SHOULD FORMULATE HONEYBEE IMPORT REGULATIONS BASED ON PHYSICAL AND GEOGRAPHICAL, RATHER THAN JURISDICTIONAL CONSIDERATIONS.

   With the continuing spread of mites in many areas of the world, as many good sources of supply as possible are needed for honeybee queens in early spring, when they are needed by most Alberta beekeepers. Serious problems exist with other sources of supply at this time of year. The State of Hawaii is geographically isolated and has not allowed the import of beestock since 1985. With a proper inspection process as proposed by Agriculture Canada, there would be a low risk of importing varroa mites with honeybee queens. Other geographically isolated, low-risk areas may also be developed.

2. THE FEDERAL AND PROVINCIAL DEPARTMENTS OF AGRICULTURE CONDUCT A COMPLETE REVIEW OF THE POLICY OF BORDER CLOSURE, TAKING INTO ACCOUNT DISEASE CONTROL ASPECTS AND ECONOMIC IMPLICATIONS, AND A REVIEW OF THE CERTIFICATION PROCESS WITH A VIEW TOWARD FINDING A PROCESS THAT WILL ENABLE IDENTIFICATION OF MITE-FREE AREAS.

   Closure of the border to beestock from the U.S. was initially intended as a short-term measure to slow or stop the spread of mites. It has now become a long-term measure with severe economic impact on some Alberta beekeepers. Achieving the objective of preventing mite introduction may be better served by a certification process. Since present detection methods cannot offer certainty that an apiary is mite-free, and depopulation does not appear to be an effective means of controlling mites, this will entail further development of detection and control methods.

3. ALBERTA AGRICULTURE ACQUIRE TECHNICAL INFORMATION FROM THE UNITED STATES AND EUROPE ABOUT VARROA MITE CONTROL METHODS AND THE IMPACT OF VARROA MITE INFESTATIONS ON PRODUCTION AND ECONOMICS.

   More information is needed on experiences from the U.S. and Europe with varroa mite control and the ramifications of varroa mite infestations on honey production. At present no pesticides are registered for varroa mite control in Canada and no data are available regarding efficacy of chemicals which could be used to support registration, should chemical control become necessary.

4. EXTENSION SERVICES TO THE INDUSTRY BE FURTHER DEVELOPED THROUGH WORKSHOPS, PRINTED MATERIAL, ON-FARM DEMONSTRATIONS, AND OTHER EXTENSION SERVICES BY FAIRVIEW COLLEGE AND OTHER INSTITUTIONS ON:

   A) BREEDING OF QUEEN HONEYBEES;

   B) "NUC" PRODUCTION AND SUMMER QUEEN INTRODUCTION;

   C) WINTER MANAGEMENT; AND

   D) DISEASES AND HONEYBEE PEST CONTROL.

   Because of border closure, many producers have had to change their beekeeping methods. Considerable research has been done on such topics as honeybee queen breeding and introduction, winter management of colonies, and honeybee pest control. Further extension efforts by Agriculture Canada, Alberta Agriculture, Fairview College and other institutions are required to teach these methods to producers.

5. FUTURE SURVEYS ON TRACHEAL MITES BE IMPLEMENTED ANNUALLY ON A COST-SHARING BASIS BETWEEN PRODUCERS AND ALBERTA AGRICULTURE.

   Tracheal mites have been found in colonies in Alberta, but the extent of their distribution is unknown. Early detection is important so that tracheal mites can be managed at low infestations; by the time they are visible, they may have spread to many hives.

B. ECONOMICS

The Committee recommends that:

1. THE FEDERAL GOVERNMENT BE REQUESTED TO ASSESS PRODUCTION SUBSIDIES TO PRODUCERS IN THE UNITED STATES AND EUROPE AND TO ATTEMPT TO RECTIFY THESE SUBSIDIES THROUGH G.A.T.T. AND C.U.S.T.A. NEGOTIATIONS OR OTHER APPROPRIATE MEANS.

   Many beekeepers feel that U.S. and European subsidies have depressed the price of honey for several years. In 1984 Alberta sold 15,600 tonnes of honey to the U.S. and in 1988 only 5,400 tonnes (Table 6).The current financial distress of the Alberta beekeeping industry would be ameliorated by improved honey prices.

2. THE NATIONAL TRIPARTITE STABILIZATION PROGRAM REPLACE INDEXED MOVING AVERAGE PRICE WITH GUARANTEED MARGIN TO DETERMINE AVERAGE PRICE OF HONEY.

   The currently used indexed moving average price does not take into account changes in yield and /or cash costs of production. Thus the current support formula does not offer a safety net against sudden increases in cash costs.

3. THE MINISTER REQUEST THE FEDERAL MINISTER OF AGRICULTURE TO REVIEW THE ECONOMIC IMPLICATIONS OF BORDER CLOSURE AND, IF WARRANTED, ESTABLISH A COMPENSATION PROGRAM FOR BEEKEEPING OPERATIONS THAT WERE ADVERSELY AFFECTED.

   The discovery of varroa mite in the United States and the resultant closure of the border occurred in October 1987, after many Alberta beekeepers had killed their colonies. The action left a significant portion of Alberta's commercial beekeepers without a means of restocking their colonies with Californian bees or offsetting wintering losses in 1988. Financial problems mounted as the border remained closed, and some of those who were the most affected received no disaster relief. Many compensation programs have been instituted to counter disasters to agricultural sectors; for example, beekeepers affected by PCB's in Quebec and grape growers in British Columbia who were impacted by the Free Trade Agreement.

4. THE MINISTER GIVE PRIMARY CONSIDERATION TO THE INTERESTS AND CONCERNS OF THE COMMERCIAL SEGMENT OF THE INDUSTRY IN THE DEVELOPMENT OF PROGRAMS.

   Over one-quarter of the honey produced in Canada and much of the honey exported from Canada is produced by Alberta's commercial beekeepers. This segment of the industry has been the most seriously affected by the ban on importation of U.S. beestock, which was their primary source of supply. Many of those who experienced the most financial distress were not aided by government programs, and some have left the business. Much seasonal employment in rural areas has traditionally been provided by this segment.

C. RESEARCH AND DEVELOPMENT

The Committee recommends that:

1. THE MINISTER REQUEST AGRICULTURE CANADA TO EXPEDITE THE REGISTRATION OF CONTROL CHEMICALS FOR USE IN HONEYBEE COLONIES.

   Several chemicals which control parasitic mites in honeybees, such as fluvalinate and menthol, are needed in Canada, as depopulation/eradication is not feasible. However, research in support of Canadian registration is not being conducted because of the small market size. Government assistance with some of the costs of registration may be needed.

2. FURTHER RESEARCH ON WINTER MANAGEMENT BE CONDUCTED AND MADE AVAILABLE TO PRODUCERS.

   Alberta beekeepers must now winter their beestock. Many methods are currently in use, with variable success. Research is needed on protein requirements for winter, optimal winter colony size, and carbohydrate substitutes. Considerable research on winter management has been done, and more transfer of this technology to beekeepers is needed.

3. INCREASED COMMUNICATION AND COOPERATION FOR THE TRANSFER OF TECHNOLOGY BE CONTINUED BETWEEN THE AGRICULTURE CANADA RESEARCH STATION AT BEAVERLODGE AND FAIRVIEW COLLEGE REGARDING:

   A) BEE BREEDING FOR MITE-RESISTANT STOCK;

   B) MITE DETECTION AND CONTROL;

   C) MITE MANAGEMENT (INCLUDING INTEGRATED PEST MANAGEMENT);

   D) WINTERING MANAGEMENT (INCLUDING ALTERNATE CARBOHYDRATES); AND

   E) BEESTOCK PRODUCTION STRATEGIES.

   The mandate of Fairview College is to provide extension services, while the mandate of the Agriculture Canada Research Station at Beaverlodge is to conduct basic research. For meeting the research needs of the industry and for technology transfer to beekeepers, there must be increased cooperation and communication between these institutions.

4. A NATIONAL ADVISORY GROUP ON RESEARCH AND DEVELOPMENT TO DETERMINE AND COORDINATE RESEARCH PRIORITIES BE FORMED.

   There is a need for direct producer input into the research and development initiatives of government and educational institutions. A national advisory group, perhaps reporting through the Canadian Honey Council, could identify industry priorities and help coordinate research.

D. MARKETING

The Committee recommends that:

1. A CHECK-OFF SYSTEM BE ESTABLISHED TO OBTAIN FUNDS FOR THE MARKETING AND PROMOTION OF HONEY AND FOR RESEARCH AND DEVELOPMENT.

   Developing, introducing and maintaining new products on the market is expensive and will require a concerted, well-financed effort, with greater involvement from all segments of the industry. A check-off system similar to that for other agricultural commodities could be established. While a national system is preferred, a western or Albertan system may be more achievable at present.

2. THE BEEKEEPING INDUSTRY, IN COOPERATION WITH PROVINCIAL AND FEDERAL GOVERNMENTS, FORMULATE AND IMPLEMENT MARKETING STRATEGIES TO DEVELOP PROVINCIAL, NATIONAL AND INTERNATIONAL MARKETS.

   Sound marketing strategies can help the beekeeping industry in Alberta achieve self-reliance. Many opportunities exist for market expansion via new product and export market development. Professional expertise is needed for examining all aspects of marketing.

3. THE INDUSTRY DEVELOP A CLOSE ASSOCIATION WITH OTHER COMMODITY GROUPS AND DEVELOP JOINT VENTURE PROMOTION PROGRAMS TO COMPLEMENT THE MARKETING AND PROMOTION OF HONEY.

   Expanded sales may be achieved through joint promotion programs of food combinations (for example, lamb and honey) and value-added products which contain honey (such as honey mustard).

4. FURTHER RESEARCH AND DEVELOPMENT INTO USES OF HONEY AND OTHER HIVE PRODUCTS BE CONDUCTED WITH POTENTIAL USER GROUPS SUCH AS FOOD PROCESSORS AND MANUFACTURERS OF SOFT DRINKS, SPIRITS, AND COSMETICS.

   Opportunities exist for growth in the industry through the development of new products which contain honey (for example, soft drinks). Because of its purity and nutritional qualities, Alberta honey could be used in products designed for special markets such as the diabetic and organically grown food markets.

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1.0 INTRODUCTION

1.1 State of the Industry

Alberta's beekeeping industry has experienced great financial and economic difficulties during the last several years. Low honey prices have reduced cash flow to producers, and the poor honey market has reduced the availability of operating credit. A large amount of beekeeping equipment lays idle, further suppressing the value of beekeeping assets.

On October 6, 1987, the Government of Canada placed a ban on the importation of honeybee stock from the United States to reduce the chance of accidental introduction of the varroa mite, a reportable pest under the Federal Animal Disease and Protection Act. The ban was subsequently renewed and is still in effect. Until this time, a significant proportion of Alberta's commercial beekeepers killed their bees every fall and relied on bees from California to restock their colonies each spring. Many of those who winter their bees also used bees from California to offset winter losses.

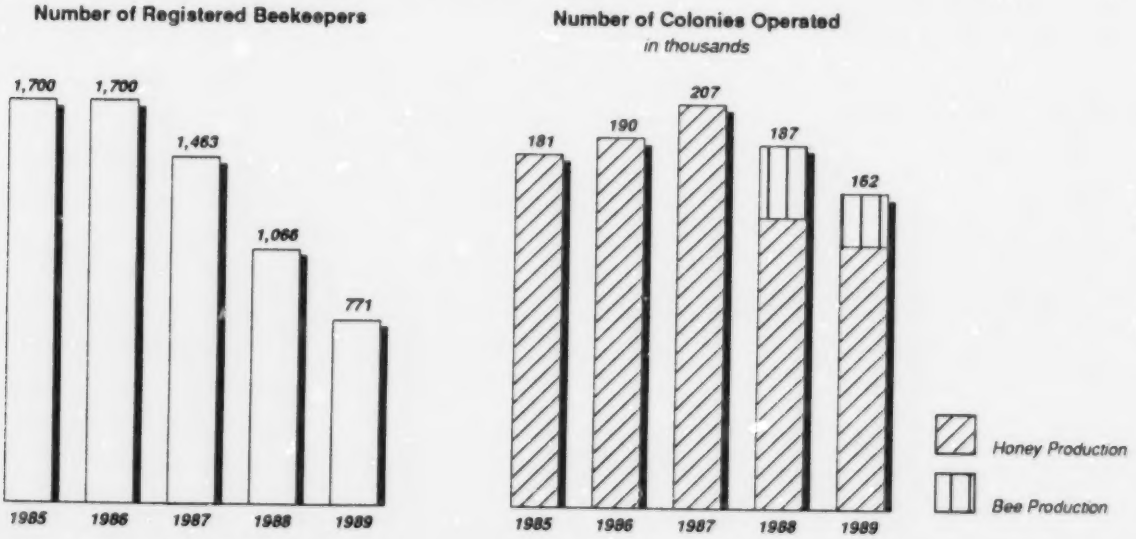
The stress resulting from low honey prices and lack of traditional beestock led some Alberta beekeepers to leave the industry. It appears that this trend has not yet ended.

Table 1. Number of Registered Beekeepers and Colonies 1983-1989

Province	*No. of Beekeepers*		*No. of Colonies*	
	1983-89 (av.)	*1989*	*1983-89 (av.)*	*1989*
Alberta	1,447	771	179,857	162,000
Ontario	4,768	5,000	113,000	110,000
B.C.	4,537	4,950	55,700	53,000
Quebec	3,357	1,700	98,429	52,000
Saskatchewan	1,643	1,500	106,714	100,000
Manitoba	1,393	1,200	105,857	87,000
Nova Scotia	568	370	6,671	6,000
New Brunswick	461	420	4,857	4,800
P.E.I.	136	100	952	790

Source: Alberta Agriculture

Figure 1 Registered Beekeepers and Colonies in Alberta 1985 - 1989



Source: Annual Report Alberta Agriculture 1990

1.2. Importance of the Industry

The Alberta beekeeping industry has played a significant role in Canada's honey production for many years. Due to favourable location and climatic conditions, Alberta has become the top honey-producing province in Canada, accounting for over one-quarter of the national production.

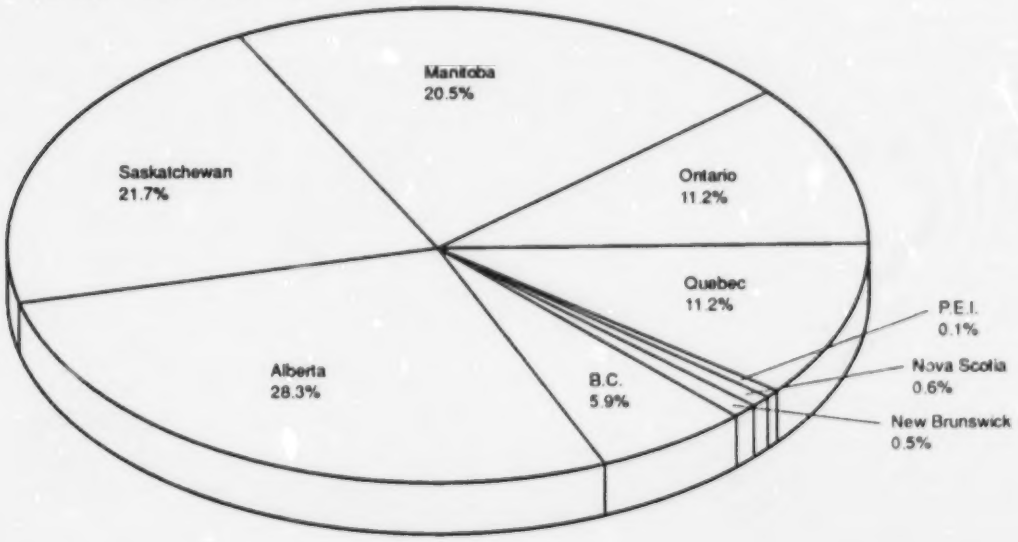
Because Alberta is a major producer of honey, it is natural that it be concerned over the appropriate influence it might have at the national level. The Canadian Honey Council seems to be over-representative of hobby beekeepers and non-producer groups, yet its advice may have significant impact on commercial producers. For instance, in 1989 Ontario had approximately 5,000 beekeepers and Alberta had less than 1,000; however, Alberta's average poduction of honey is approximately two and one-half times that of Ontario. To put the matter in another light, Alberta's average production is about equal to the combined production of P.E.I., New Brunswick, Nova Scotia, Quebec, Ontario and British Columbia. However, Alberta's honey producers have only one vote on the Canadian Honey Council.

Table 2. Average Honey Production, 1983 to 1989

Source	*Lbs (000's)*	*Metric Tonnes*	*Percent*
Alberta	22,956	10,413	28.3
Saskatchewan	17,574	7,972	21.7
Manitoba	16,605	7,532	20.5
Quebec	9,124	4,139	11.2
Ontario	9,068	4,113	11.2
British Columbia	4,792	2,173	5.9
Nova Scotia	430	195	0.6
New Brunswick	386	167	0.5
Prince Edward Is.	87	40	0.1
Canada	81,002	36,743	100.0

Source: Alberta Agriculture

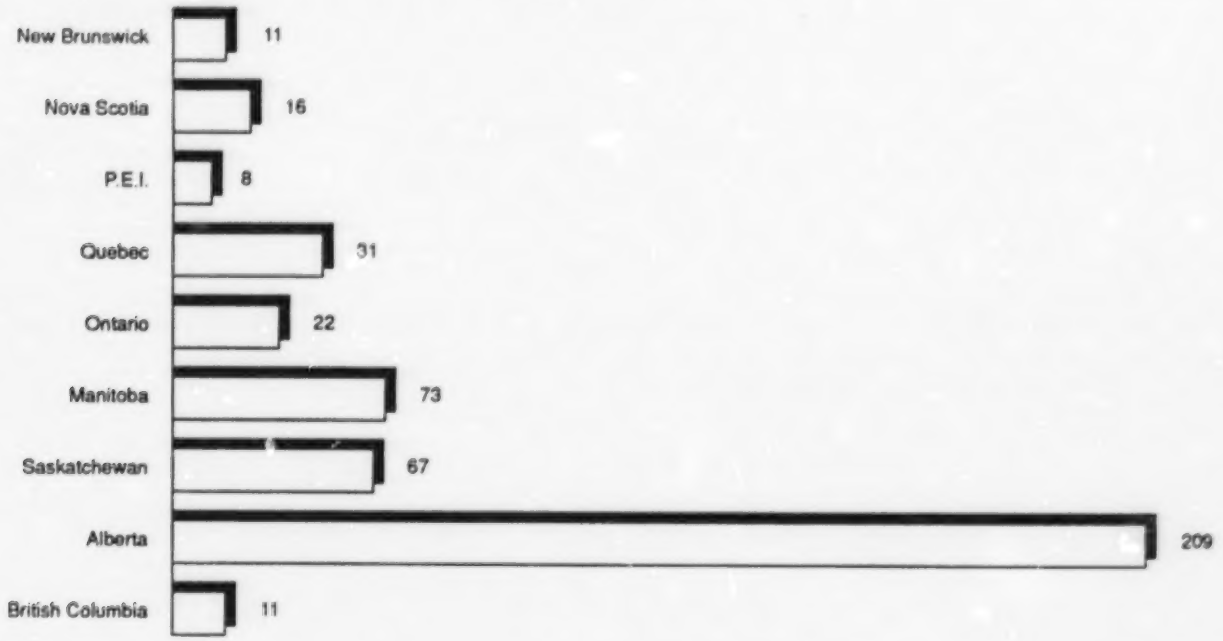
Figure 2. Honey Production in Canada



The average annual value of honey produced in Alberta from 1983 through 1989 was $12.4 million (calculated at the average farm-gate price of $1.19/kg or $0.54/lb for these years). Approximately 80 percent of this honey was exported to the United States.

Alberta produces more honey on a commercial scale than do other provinces. In 1989, the 771 registered beekeepers in the province operated a total of 162,000 colonies, with an average of 209 colonies per beekeeper. This high level of commercialization brings considerable seasonal employment to rural areas.

Figure 3. Average Number of Colonies per Beekeeper, 1983 - 1989



The beekeeping industry is also beneficial to crop production in Alberta. It has been estimated that approximately $3 million could be lost in the Peace River area from non-pollination of forage seed crops (Smoky River Regional Tourism and Trade Society, 1988). Some varieties of canola require cross pollination for maximum yield. One such variety accounted for 80 percent of the canola grown in the Peace River district on approximately 308,000 hectares in 1987. In addition, new hybrid varieties of canola were first introduced in the province in 1989. These are dependent on cross-pollination to produce seed, and acreage is expected to increase in the near future. Overall, pollination by honeybees may contribute as much as $150 million to crop production in Alberta, based on the direct value of pollinated crops and the contribution of pollinated forage crops to the production of meat, poultry and dairy products (D. MacDonald, SKEPtic, Dec. 1984).

1.3 The Alberta Beekeeping Industry Advisory Committee

1.3.1 Purpose of the Committee

In September 1989, the Honourable Ernie Isley, Minister of Agriculture, established the Alberta Beekeeping Industry Advisory Committee in recognition of the difficulties facing the industry. In announcing the formation of the Committee, the Hon. Mr. Isley said:

> The beekeeping industry in Alberta has experienced a number of setbacks in recent years. We must take a good look at the problems facing the beekeepers so that we can develop an effective plan of action to help strengthen the industry.

The Committee's responsibility was to make recommendations to the Minister concerning problems now affecting the economic viability of the beekeeping industry and to formulate recommendations for the Minister addressing the long-term objectives of the industry in the domestic and international honey markets.

1.3.2 Membership

The membership of the six-member Committee has been:

Chairman: Mr. Walter Paszkowski, M.L.A. Smoky River
Mr. Don Tannas, M.L.A. Highwood
Mr. Rick Sloan, Northern Development Branch
Mr. Jim Hale, Producer, Northern Region
Mr. David Tharle*, Producer, Central Region
Mr. Dale Philpott, Producer, Southern Region
Secretary: Dr. Michael Dorrance**, Alberta Agriculture (non-voting)
Writer: Ms. Louise Horstman

* replaced Mr. Jim Christensen in November.
** replaced Mr. Paul van Westendorp in February 1990.

1.4 Research Process

1.4.1 Committee Meetings

Committee meetings were documented and the minutes distributed to members and the Minister of Agriculture.

The Committee endeavored to maintain close communication with the Alberta Beekeepers Association (ABA). ABA President J. Smith and Business Manager G. Adair met with the Committee several times to share ideas. To aid in its understanding of various programs, the Committee also drew on the expertise of departmental officials. Persons with whom the Committee met and subjects of discussion included:

Mr. Joe Smith, President, Alberta Beekeepers Association
- Progress of the Committee's work

Ms. Gertie Adair, Alberta Beekeepers Association
- ABA activities

Mr. Ken Moholitny, Alberta Agriculture
- National Tripartite Stabilization Program

Mr. Andrew Church, Alberta Agricultural Development Corporation
- AADC loans to beekeepers

Mr. Cliff Wulff, Market Development, Alberta Agriculture
- Marketing and promotion of agricultural commodities

Mr. Lloyd Andruchow, Alberta Agriculture
- Sugar Price Reduction Program implementation

Mr. J. Harold Hanna and Mr. Don Macyk, Production, Alberta Agriculture
- Progress of the Committee's work

1.4.2 Public Meetings

The Committee believed it was vital to obtain input from the industry. For this reason, public meetings were held in three key beekeeping areas in the southern, central and northern portions of the province: Brooks, Edmonton, and Girouxville. A notice of meeting was sent to each registered beekeeper in the province and to all Alberta Agriculture district offices. Notices were also placed in the newsletter of the Alberta Beekeepers Association. Beekeepers were invited to submit oral or written briefs on any issue affecting the industry. The Committee also invited written briefs after the meeting, in the event that the meeting generated further ideas.

Information in the submitted briefs was evaluated at subsequent Committee meetings and became the most important resource in formulating recommendations to the Minister.

The public meetings are summarized in Chapter 6.

2.0 PRODUCTION ISSUES

2.1 Beekeeping in Alberta

2.1.1 Overview

Early settlers brought honeybees to the Alberta area in the late 1800s for their own use and wintered them using a variety of innovative methods. The mid-1920s saw the beginning of commercial apiaries in southern and central Alberta. These operators wintered their hives but turned to less severe climates for obtaining beestock for expansion and replacement of losses. Ontario initially filled this need, but as the United States offered stock at an earlier date, beekeepers began to import from California.

By the 1940s, the expanding industry in Alberta had all but stopped wintering. The development of the "package," a standardized shipping cage, provided ease of handling and allowed low-cost American bees to be transported in large numbers over long distances. The beekeeper could produce a honey crop without high input costs and the uncertainties of keeping bees over the winter. The industry continued to grow during the 1950s and 1960s, with the greatest expansion in the Peace River region.

Honey prices in the 1970s promoted a sharp rise in the number of hives across the province: the number of colonies rose from 110,000 in 1970 to 160,000 in 1980. As the California suppliers pushed to meet a mushrooming prairie market, the price of packages increased while the availability of quality packages and queens declined. Many of Alberta's commercial operators began to see their total dependence on this source as a liability. A new interest grew in retaining beestock from year to year.

By 1984, 28 percent of Alberta's hives were being wintered in Alberta or southern British Columbia. The new threat of accidental mite introduction into an apiary moved more operators away from packages. By 1987, the last year in which package bees were allowed from the U.S., 71 percent of the colonies in Alberta were being wintered by 64 percent of Alberta's 278 commercial beekeepers (i.e. those with over 200 hives). The majority of package bee operators were located in the Peace River region. Some felt that their climate prevented successful winter maintenance of bees, and many believed that the advantages of their type of operation outweighed those of overwinter bee operations.

2.1.2 Overwinter Bee Operations

A wide variety of management techniques are used with variable success in overwinter bee operations. This type of operation requires considerable expertise and capital investment and a longer work period than does the package bee type of operation.

In April and early May, colonies are inspected. At this time, many beekeepers replace failing queens, split strong colonies, and boost weak ones. When strong colonies are divided, an additional honeybee queen is introduced into the queenless divide to help it develop into a full-strength honey-producing unit. As Canada's climate does not allow the production of viable and vigorous honeybee queens until mid-May, a source of queen bees for early spring is critical.

During late August and early September, hives are culled and fed sugar and medication for winter. During October the colonies are wrapped with insulation or moved to indoor facilities or, in some cases, to warmer climates such as southern British Columbia. The long-term winter mortality rate of honeybees in Alberta is approximately 15 percent.

Restrictive policies and regulations have recently been applied to the interprovincial movement of bees from Alberta to British Columbia. The B.C. Ministry of Agriculture and Fisheries currently allows limited movement of bees into southern B.C. for winter, provided that operators comply with the following requirements:

- only those allowed previous year, and similar number of hives
- health certificate declaring bees "apparently free" of tracheal mites
- cannot move in if originated within 10 km of a mite-infested apiary
- date for entry and exit set by B.C. Apiculture Program
- permit from the Apiculture Program
- 10 km from nearest established bee stock producers (less if geographical situations lessen the risk)
- sampling for tracheal mites must be allowed at any time and cost of sampling and analysis will be recovered from the owner.

2.1.3 Package Bee Operations

In this type of operation, imported 2-lb packages of honeybees and a honeybee queen are placed into the hive in early April. The bee population then expands to take advantage of available nectar sources in June through mid-August. After the honey is harvested in mid-August, the bees are killed and the empty equipment is stored for winter.

Between $3 and $4 million was spent annually for the procurement of beestock by Canadian package bee operations, most of which are in Alberta. Although the package bee operation has optimized efficiency and yielded excellent returns, a major disadvantage is the small size of the area from which most of the beestock has been obtained. The undetected presence of a disease or pest within this area could cause its rapid distribution in Canada.

2.1.4 Research and Extension in Winter Management

Research

A considerable amount of research has been directed toward winter management of bees in the province. However, there are a number of areas which still need to be addressed as described below:

Carbohydrate Sources

Sugar purchases have become the single largest operating expense of most beekeeping operations. Efforts are being made to reduce the amount of carbohydrates needed for each wintering unit. This may be accomplished by reducing the number of bees in the winter unit, and consequently the unit's sugar requirements; or by using alternative sources of carbohydrates, such as high fructose corn syrup. The optimal winter colony size has still to be determined.

Protein Sources

Pollen is the natural protein source for honeybees and is essential to the development of brood in early spring. Insufficient pollen reduces or prevents the onset of brood rearing. Colonies can be stimulated to rear brood before natural sources are available by providing stored pollen or feeding pollen substitutes. Further research and development may be directed towards the optimum protein requirements of colonies entering the winter.

Extension

Beekeepers who never wintered their beestock prior to closure of the border must now do so. As a result, more extension services on winter management methods are needed. Extension priorities include fall preparation, improved wintering methods and materials such as winter wraps and wintering buildings, and winter-hardy beestock.

2.2 Parasitic Mites and Africanized Bees

2.2.1 Varroa Mite

Background

The varroa mite, *Varroa jacobsoni* (audemous), is an external parasite of the honeybee. Originating in southeast Asia, it has spread to most continents and has seriously affected many honey-producing areas. The western honeybee common to North America, *Apis mellifera* L., is highly sensitive to varroa mite: without treatment a colony will die two or three years after initial varroa mite introduction. The varroa mite is a reportable pest under the federal Animal Disease and Protection Act.

Varroa mites affect adult bees and brood. Early stages of development occur in bee brood, from which adult females later emerge to complete their life cycle by parasitizing adult honeybees. The spread of the mite is facilitated by drifting of adult bees to other colonies and apiaries.

Rather unexpectedly, the varroa mite was discovered in the United States in September 1987. On 6 October 1987, the Canadian government placed a temporary ban on the importation of beestock from the United States. A two-year ban was put into effect on 1 January 1988 and was renewed for two years in January 1990.

The temporary ban was imposed soon after many package bee operators had killed their colonies. Although aware of possible border closure for the varroa mite, many operators felt that a "certified mite-free" control mechanism, such as that used for control of tracheal mites from California and the rest of the United States, would be established. Many also expected that the border would be reopened at least for the 1988 season.

In the spring of 1988, a national varroa mite survey was conducted throughout Canada. Provincial governments in cooperation with Agriculture Canada carried out surveys using fluvalinate (see below). No varroa mites were found. A contingency plan was prepared in the event of their discovery.

In the fall of 1989, Agriculture Canada conducted a second survey in which colonies in a 16-km corridor along the U.S.- Canadian border were randomly sampled. No varroa mites were found in Alberta. Varroa mites were found in a seven-colony apiary in New Brunswick. The infested apiary was destroyed, and surveys in surrounding areas were planned for the following spring. The proximity of the affected apiary to the border suggests that infested bees had drifted across the border from Maine, where the varroa mite was known to be present.

Research into Detection and Control

Detection

Early detection of the varroa mite is essential. The three detection methods below have been used or proposed. However, better, less expensive detection techniques are needed.

a) Ether-roll method. Ether added to a jar containing 500 - 1000 bees causes the mites to dislodge. They can then be seen on the sides of the jar. This method is cumbersome and inaccurate at low infestation levels.

b) Fluvalinate method. Fluvalinate (Apistan), a new synthetic pyrethroid, has been widely used under research permit for detection of varroa mites in all provinces. Since the acaricide is placed into the brood chamber, the entire colony is exposed to it, resulting in a more accurate test. In the field, the method is expensive because of the required return visit after three days of exposure.

c) Alcohol method. A 2,000-bee sample is collected by vacuum and agitated in alcohol, causing the mites to dislodge. Specimens are then examined under microscope. This method is inexpensive and accurate at low infestation levels, but requires a large sample.

Control

No chemicals are registered in Canada for controlling mites in honeybees, and no efficacy data are available on such chemicals (for example, Amitraz and formic acid). Canada should fund research

being conducted in other countries on acaricides so that information enabling Canadian registration will be available if and when varroa mites are found in Canada.

2.2.2 Tracheal Mite

Background

The tracheal mite, *Acarapis woodi*, is a parasite which completes its life cycle within the trachea (breathing tubes) of the adult honeybee. Low levels of infestation show no overt symptoms.

Although widely distributed throughout Europe for many years, the tracheal mite was not discovered in the United States until 1984. In the following two years, over 28 states on the mainland reported infestations. It is possible that the mite was present before 1984, since widespread testing only began after its discovery.

The tracheal mite has now been found in all western Canadian provinces. With the exception of Alberta, all provinces have initiated control policies entailing the depopulation of infested apiaries.

In January 1989, tracheal mites were discovered in the Peace River region. The Alberta Beekeepers Association requested that the provincial government not implement a depopulation control policy but rather initiate a province-wide mite survey. In Alberta, a Tracheal Mite Action Plan was presented to the Alberta Beekeepers Association in September 1988. It proposed the principle of depopulating infested apiaries. Beekeepers throughout the province expressed opposition to the proposed policy. Since the spring of 1989, control of mites was not mandatory. In the province-wide survey, tracheal mites were found in seven beekeeping operations in the Peace River region.

Research into Detection and Control Methods

Detection

The only detection technique currently available for tracheal mites requires microscopic examination of individual bee specimens. The collection of bees in the field and subsequent preparation and analysis in the laboratory is time-consuming and expensive. Furthermore, present techniques cannot detect mites at low infestation rates in individual hives. Mites can be detected in apiaries or in operations, but the methods are not adequate to cull individual hives. To the commercial beekeeper, accurate information on low infestations is important, since this allows the use of economical control measures. Once an infestation becomes apparent, the mite may have spread to many hives. Therefore, an inexpensive, fast method to detect mites in individual hives is needed.

The enzyme-linked immunosorbent assay (ELISA) technique holds promise as a rapid and accurate detection method. At present, this method is not able to distinguish among mite species, some of which are harmless.

Control

Recent research has shown menthol to be an effective and inexpensive control agent. Although not presently registered for use in honeybee colonies, menthol is classified as a food additive and flavoring agent in Canada. It occurs naturally in honeys obtained from the mint family. Menthol may be registered in Canada for use in honeybee colonies in 1990.

Amitraz has been used in the U.S. as a fumigant or contact acaracide for tracheal and varroa mites. The compound is reported to be effective against immature mite stages. However, Agriculture Canada has been concerned about its toxicity and will likely delay its registration for use in bee colonies.

Integrated Pest Management

The development of Integrated Pest Management (IPM) may also reduce the impact of tracheal mites. IPM involves the simultaneous employment of several prevention and control methods, none of which provide adequate control by itself. Much of IPM can be accomplished through specific

beekeeping management techniques which reduce the risk of mite introduction into an operation and also reduce the negative impact of the mite when already present.

For some beekeepers, the incorporation of IPM would require few changes in operating method, while for others, major changes would be necessary. Educational institutions such as Fairview and Olds College would be suitable for the development of IPM methods for parasitic mites. Workshops, training courses, publications, and other extension services may be employed in the dissemination of this information.

Some European bee strains that have been exposed to the tracheal mite for many years have developed some degree of resistance to the mite. A bee breeding program is in progress to develop mite resistance by importing selected drone semen and larvae from the United Kingdom and Europe. Bee breeding programs at Cornell University and at the U.S.D.A. facility at Baton Rouge are examining the potential for breeding resistance for tracheal and varroa mites, respectively. Guelph University is planning to look for resistance to tracheal and varroa mites, although this program has not yet begun. Mite-resistant strains that have a higher level of tolerance to mite infestations should be developed in bee breeding programs.

2.2.3 Other Parasitic Mites

Another mite, *Tropilaelaps clareae*, is reported to be as destructive as the varroa mite and similar in parasitism. It has not been reported yet outside southeast Asia; however, since the varroa mite was considered exotic a few years ago, vigilance for this mite and research on its general biology and potential economic impact are warranted.

2.2.4 Africanized Bees

African bee strains imported into Brazil during the 1950s were accidentally released, resulting in the hybridizaton of local bee strains. The dominant characteristics of the African bee, which include strong swarming and aggressiveness, prevailed through the continent-wide spread of African hybridization.

In response to the genuine threat to North American bee strains, the U.S. and Mexican agriculture departments embarked on a multi-million dollar project to stop or slow the northward spread of the bees through Mexico. However, the project failed, and Africanized bees are expected to enter the U.S. in June 1990.

The introduction of Africanized bees will have serious ramifications for beekeeping and agriculture. The bees are ineffective crop pollinators and poor honey producers. Their aggressive behaviour will prevent their placement near human habitation. The inevitable occurrence of bee attacks will result in litigation against beekeeper and farmer, and may generate fear among the general public. Local and regional jurisdictions are expected to pass bylaws limiting the placement of honeybee colonies. Concern over the possibility of litigation may cause beekeepers to leave the industry. It is expected that the American beekeeping industry will decline significantly during the next 5 to 10 years. Declines in the availability of pollinating bee colonies are expected to have far-reaching effects in areas with crops dependent on insect pollination.

The Africanized bee's ability to survive colder climates is limited by its lack of food reserve build-up. However, the introduction of Africanized bees into North America involves the sudden exposure and subsequent integration of two large gene pools. Hybrids that tolerate winter conditions in parts of Canada might be produced in the future .

Whether Africanized bees adapt to this climate or not, they will have a direct effect on Canadian beekeeping by:

- influencing the public attitude toward bees;
- reducing the availability of bees from the continental U.S. should the border be opened;
- offering the opportunity for export of bees from Canada if Canada remains free of Africanized bees.

2.3 Procurement of Honeybee Queens

Beekeepers in Alberta must rely on sources of honeybee queens from outside the province for the start-up of the honey-producing season, which takes place in April. Honeybee queens cannot be produced in Alberta until about the first week of June because of the minimum outdoor temperature required for mating. As the northernmost honey-producing area is almost 1,000 km north of the southernmost area in Alberta, queen production takes place later there due to climatic differences. Thus northern beekeepers are even more dependent on an external supply of honeybee queens.

With the threat of mite infestations in many parts of the world, safeguarding a supply of high-quality honeybee queens for early spring entails having a number of possible sources of supply.

2.3.1 Canada

The earliest honeybee queen production in Canada begins in mid-May in British Columbia and Ontario. Although artificial insemination is possible, this technique has not been used extensively in Canada. Honeybee queens are available from British Columbia by mid-May, but supplies are limited and quality has not been consistent.

From June until the end of August, many parts of Canada offer excellent climatic conditions for the large-scale production of honeybee queens. Honeybee queens may be purchased from producers in Alberta from June through August. In January 1989, the Alberta Queen Breeders Association was formed with 14 members.

2.3.2 Australia and New Zealand

Limited quantities of beestock have been imported from Australia and New Zealand since the late 1970s. During the 1980s several beekeepers regularly purchased beestock from these sources. With the closure of the U.S. border, these sources acquired greater importance to Canadian beekeepers, being the only overseas sources of beestock still available to them. Importation of Australian and New Zealand beestock increased substantially in 1988. Both countries are believed free of harmful parasitic mites.

In the public meetings, many beekeepers reported experiencing the following problems with supplies from Australia and New Zealand:

- high transportation costs;
- availability of supply unreliable at critical periods;
- less flexibility of transactions: quantities must be specified earlier; no opportunity for replacement shipments; weak guarantees

In addition, the honeybee queens obtained were reported to have several serious disadvanatages, namely:

- variable degrees of winter-hardiness;
- poor physiological condition due to the seasonal difference of one-half year;
- reduced acceptance by colony;
- reduced performance and lifespan, probably due to stress during shipment.

Although some of these problems may be eliminated over time, the high cost and risks will remain. Many producers are therefore looking for other sources.

2.3.3 Hawaii

The ban on importation includes the State of Hawaii, apparently because of initial concern about the potential for transshipment from the continental U.S. to Canada via Hawaii.

Hawaii is considered to be one of the most reliable and affordable alternative suppliers. Since the border closure, the Alberta Beekeepers Association has consistently supported the importation of queen bees from Hawaii. Discussions at the public meetings held by the Committee also showed strong support for this. The reasons cited in favor of importation are:

- It has been illegal to import bees to Hawaii since 1985.
- No parasitic mites have been found in seven consecutive years of state-wide testing of commercial and hobby apiaries by the Hawaii Department of Agriculture.
- It is in the best interest of the U.S. to keep mites out of Hawaii.

The Kona Queen Company, a commercial queen-rearing operation in Hawaii, with customers in 27 countries, has stated its intent to expand production if Canadian imports from Hawaii are allowed.

In 1989, Agriculture Canada conducted a risk analysis on the importation of honeybee queens from Hawaii into Canada. It concluded that with the implementation of a control program which would include the temporary placement of Canadian inspectors in Hawaii, the risk of accidental varroa mite introduction would be low. The control provisions required are:

- adequate sampling of bees in the State of Hawaii;
- sampling of the area around the apiary of origin;
- sampling the apiary of origin;
- treating the colonies and apiary with fluvalinate;
- visually inspecting individual queens prior to shipment; and
- placing a Canadian expert in Hawaii to supervise the shipments over a six-week period.

The Government of Canada has indicated willingness to allow Hawaiian queen imports, provided the importation plan has the support of the Canadian Honey Council. The Council has been requested on several occasions to support efforts by Alberta producers to gain access to Hawaii beestock. To date, it has rejected this request. Although not formally documented, the Council's position seems to be:

- Only a few beekeepers wish to obtain Hawaiian beestock;
- There is widespread mistrust of some American suppliers in Hawaii with regard to mite control;
- If provincial or federal jurisdictions finance the cost of Canadian inspectors on Hawaii, these honeybee queens will be heavily subsidized. This money might be better spent elsewhere to benefit all beekeepers.

2.3.4 Research on Production in Alberta

Fairview College has established a queen-breeding program in cooperation with the Research Station at Beaverlodge with the objective of transferring the technology of queen bee-breeding to beekeepers. Extension courses in honeybee queen production should continue to assist beekeepers to become more self-sufficient in the future.

Further research and development in Alberta-raised beestock, combined with extension, would help the industry become more self-sufficient. Future endeavors in the production of Alberta honeybee queens must include a selection process whereby desirable characteristics such as high honey yield, winter hardiness, gentleness, disease resistance, and mite-resistance will be incorporated into the stock.

2.4 Pesticides and Residues

2.4.1 Pesticide Effects on Bees

Rural municipalities annually carry out weed control programs through spraying. In most cases, the herbicides used do not have a direct impact on honeybee colonies. However, roadsides offer substantial bee forage, and some beekeeper groups have expressed their concerns about the extent of this practice and its effect on the availability of bee forage.

Crop spraying for insect pest control has caused considerable damage to bee colonies in some parts of the province. In southern Alberta where alfalfa constitutes a major bee forage crop, hives have been lost each year as a result of aerial spray application. Although beekeepers recognize the need for such spraying, they would prefer a 24-hour warning to enable them to move their colonies. An improved communication protocol between farmer, beekeeper and aerial applicator may reduce annual losses in bee poisonings.

Although Canadian honeys are known for their purity and high quality, importing countries such as Germany and Japan have begun to test routinely for pesticide residues and other contaminants in honey. Modern techniques allow the detection of residues in parts per million or billion. For Canadian honey producers to retain or develop overseas markets, the absence of any residues or contaminants in honey is of great importance. Producers must become extremely careful in the handling of any chemicals in the field or honey house to ensure that no contamination takes place. Testing facilities are needed to ensure that no honey with residues enters the market.

2.4.2 Use of Other Agents

Agriculture Canada's Product Inspection and Grading Branch has been testing honey for the presence of oxytetracycline, phenal and sulfathioxole. Oxytetracycline is used to control American Foulbrood and other bacterial diseases. Sulfathioxole, also used for this purpose, has never been approved for use in honeybee colonies because of its slow breakdown, which increases the risk of residues. A third chemical, phenal, is a bee repellent traditionally used by beekeepers during harvesting. Today, no repellents or butyric anhydride, which also leaves residues in dairy products, are used during harvesting. As with pesticides, Canadian testing facilities would ensure that only honey of the highest quality and purity is marketed.

3.0 ECONOMIC ISSUES

The beekeeping industry as a whole experienced economic difficulties beginning in 1987. These arose from several factors, the most significant being the low price of honey, high price of sugar, and necessity of keeping beestock over the winter. Commercial package operators in the northern part of the province were the most severely affected.

3.1 Alberta

3.1.1 Decline in Number of Operators and Colonies

All regions of Alberta experienced a decline in the number of registered beekeepers in 1988 and 1989 (Table 3). The number of colonies also declined in the southcentral, northwest and Peace River regions in 1988 and 1989, while increasing in the southern, central and northeast regions. The most dramatic drop was in the Peace River region, where the number of colonies had declined by 21,000 (34 percent) by 1989 over the 1983-87 5-year average. The northwest region experienced a decline of 9,000 colonies, or 16.4 percent. Of the colonies still being operated, another 20 percent were taken out of honey production in order to produce beestock.

Table 3. Number of Beekeepers and Colonies in Alberta By Region

	1983-87 (av.)	1988	1989
	No. of Beekeepers		
outside province	—	7	8
south	127	86	55
southcentral	267	161	113
central	261	154	111
northeast	190	100	78
northwest	598	391	281
Peace River	215	167	125
	1,658	1,066	771
	No. of Colonies		
outside province	—	1,342	1,466
south	27,900	31,779	31,109
southcentral	12,400	11,660	11,338
central	9,400	10,113	8,076
northeast	11,000	18,640	17,745
northwest	55,400	49,517	46,329
Peace River	67,100	53,052	46,393
TOTAL	183,200	176,103[1]	162,456[1]

source: Alberta Agriculture, Statistics Branch

– numbers incorporated into other regions

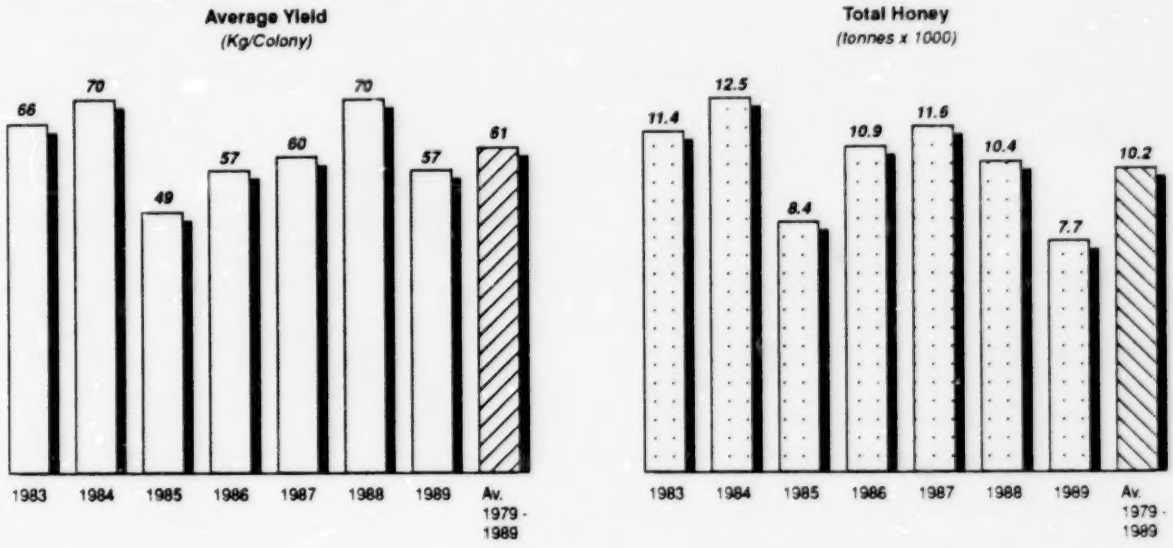
[1] does not reflect post-registration losses due to winter mortality and other factors.

In 1988 there were approximately 150,000 honey-producing colonies and in 1989, 135,000.

3.1.2 Decline in Honey Production

Honey production in the province fell from 11,600 tonnes in 1987 to 7,700 tonnes in 1989, in spite of similar yields per colony (Figure 4).

Figure 4 Alberta Honey Production



Source: Alberta Agriculture, Statistics Branch

3.2 Peace River Area

The primary impact of border closure and other contributing factors was felt in the Peace River area. In written submissions to the Committee and at the public meeting in Girouxville, Peace River area beekeepers described severe financial problems. A similar pattern ran through many of these descriptions. In general, their businesses, many of which were full-time family beekeeping operations, were described as being profitable prior to the closure of the border to U.S. beestock in October 1987. Having killed off their bees before border closure, and with no re-opening of the border the following spring, they were faced in 1988 with the problem of restocking bees and queens from new sources and preparing for winter maintenance of bees. Some producers made the decision to stop operating in 1988. Others obtained bees from British Columbia or Australia/New Zealand at double or triple the prices to which they were accustomed. To build up colony numbers, honey production was forfeited. Money was borrowed for wrapping materials or construction of winter buildings, sugar for winter, and extra labour.

Some beekeepers reported severe winter losses of bees in 1988/89. That spring, some obtained queen bees, with poor results, heavy losses, and high costs. Others were unable to obtain the number of queens needed. Unable to repay their debts following two years of lost revenue, some operators went out of business. Others sought full or part-time employment and continued to operate with a reduced number of hives.

As beekeepers went out of business, surplus beekeeping equipment lay idle or was sold at "fire-sale" prices by financial institutions and beekeepers. The greatly decreased value of this equipment, traditionally used as collateral, made credit difficult and more expensive to obtain.

Results of a survey of 41 beekeepers who had operated 100 or more hives as of 1987 in the Municipal District of Smoky River and communities of McLennan, Donnelly, Falher, Girouxville and Eaglesham were submitted to the Committee by the Smoky River Regional Tourism and Trade Society. The survey, endorsed by the administrators of these communities, reported that between

1987 and 1989, the area experienced:

- a 51 percent decline in the number of beekeepers in operation (21/41);
- a decrease of 14,800 active hives;
- loss of 114 full- or part-time jobs; and
- overall economic loss of $1.8 million.

The survey found that many of the beekeepers still had hives in storage, hoping for beestock to become available. Some who kept bees through the winter reported losses of 10 to 67 percent.

3.3. Other Contributing Factors

3.3.1 Price of Sugar and Alternative Carbohydrate Sources

With the necessity of maintaining beestock over the winter, the cost of refined sugar became the major operating cost for commercial beekeepers in Canada. For example, with a full-strength colony requiring about 27 kg of sugar for the winter, a 500-colony operation would require about 13,500 kg of sugar.

In 1988 and 1989 the price of sugar rose to about 20 percent above its normal range of $0.56-$0.67 /kg ($22 to $27 per 40-kg bag) over the past ten years (with the exception of 1980). This price rise took place at the same time as a fall in the price of honey (Figure 5).

Table 4. Alberta Refined Sugar Prices, 1979-1989

	Alberta Refined Sugar Price	
	(CAN $/40 kg)	($/kg)
1979	22.36	0.56
1980	52.12	1.30
1981	26.64	0.67
1982	22.12	0.55
1983	26.84	0.67
1984	22.44	0.56
1985	24.44	0.61
1986	24.44	0.61
1987	26.04	0.65
1988	31.24	0.78
1989	35.44	0.89

source: Alberta Honey Producers Co-operative Ltd.

* Prices paid by individuals may have varied somewhat from those cited.

Relatively high sugar prices are expected to continue over the next several years, as world consumption is expected to continue exceeding supply.

A sugar alternative, high fructose corn syrup, has been used successfully by beekeepers in Manitoba for many years. HCFS #55, a ready made product containing 77 percent sugar solids, is available in bulk quantities from Minnesota. The price has generally been between 10 and 20 percent below that of granulated sugar. However, when the cost of shipping and bulk storage are added, the price of per unit of sugar becomes about equal to that of refined sugar.

3.3.2 Price of Honey

The price of honey added to the economic problems of the industry. Starting in 1986, as a result of the operation of the U.S. buy-back program, it began a steep decline which continued through

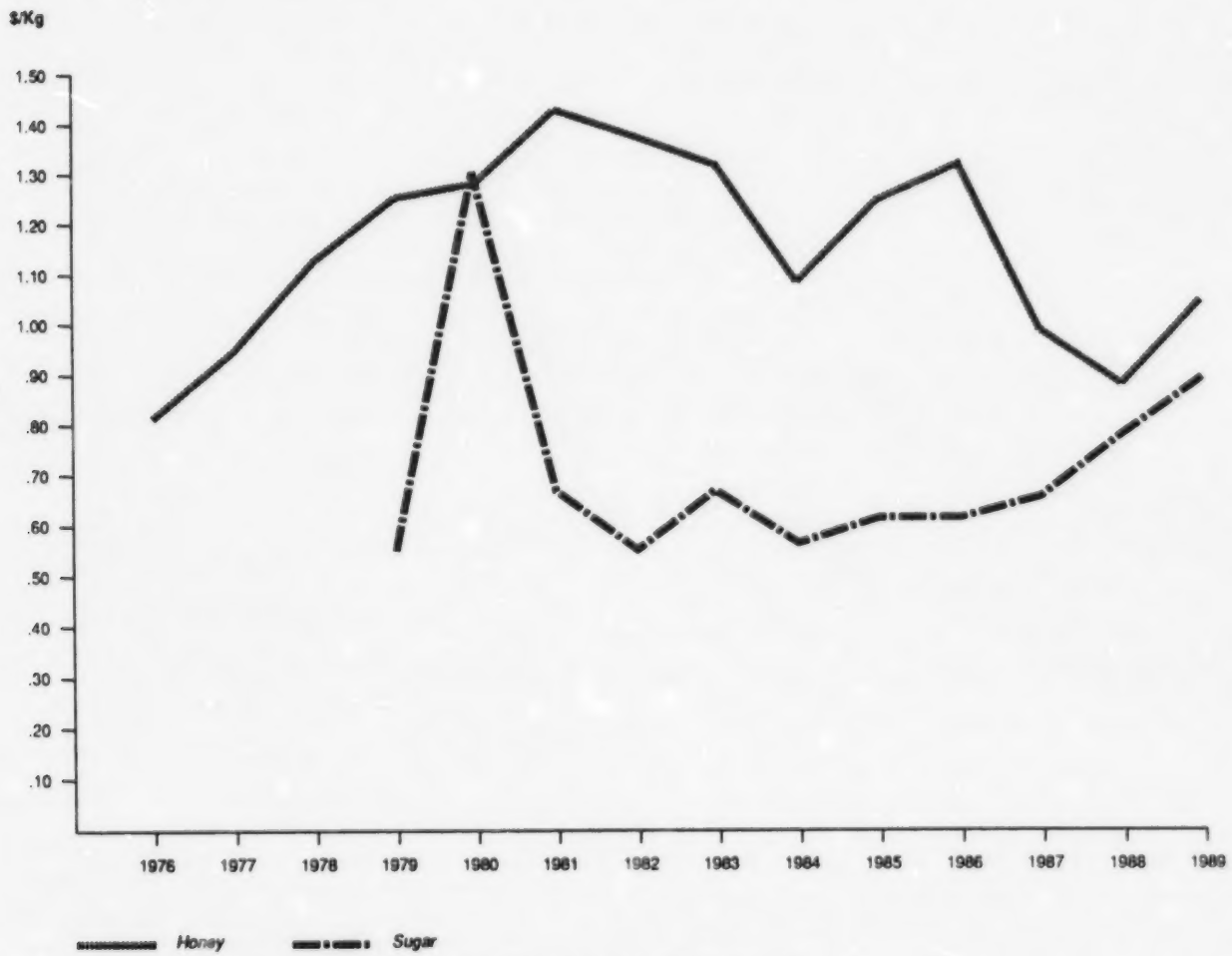
1988, when the price reached its lowest value since 1975. Farm gate honey prices in 1987, 1988 and 1989 in Alberta were below the ten-year average price by 23, 26, and 13 percent, respectively.

Table 5. Alberta Honey Prices, 1979-1989.

	$/kg	$/lb
1977	0.95	0.43
1978	1.12	0.51
1979	1.26	0.57
1980	1.28	0.58
1981	1.42	0.64
1982	1.37	0.62
1983	1.32	0.60
1984	1.07	0.48
1985	1.24	0.56
1986	1.32	0.60
1987	0.92	0.42
1988	0.88	0.40
1989	1.04	0.47

Source: Alberta Agriculture, Statistics Branch

Figure 5. Sugar and Honey Prices



Source: Alberta Honey Producers Co-operative Ltd. and Alberta Agriculture, Statistics Branch

3.4 Government Programs Affecting Beekeepers

Certain ad-hoc, short-term government support programs were established to maintain the industry and prevent further declines in beekeeping and honey production.

3.4.1 Short-term Programs

Alberta Beekeeper's Disaster Fund

Initiated in early 1988 in recognition of the increasing costs brought about by border closure, the Alberta Beekeeper's Disaster Assistance Program provided advance payments of $10 per colony based on either the number of colonies operated as of July 1, 1988 or the number in preparation for winter as of October 1, 1988.

Sugar Price Reduction Program

The Sugar Price Reduction Program, in effect since August 1989, was introduced to assist with winter and spring sugar feeding costs for bees. It provided up to $3 per 40-kg bag of sugar or equivalent. Payment is based on the number of registered colonies in 1989.

Special Canadian Grain Program

This program, funded by Agriculture Canada, was designed to help offset financial hardship caused by European and U.S. subsidy programs. It paid $7.82 per hive operated in Alberta in 1987.

Assistance Programs Shortfalls

The short-term programs above were geared toward the yearly circumstances of the industry and marketplace. The eligibility criteria of these ad-hoc programs created some circumstantial problems. Some producers qualified for assistance under some programs while others did not. For example, the Disaster Fund did not help those who no longer had bees.

This is not to say that the programs were not important. The cost of sugar, for example, remains critical to the industry, and as long as it is gh in relation to honey prices, some assistance may be necessary. From the informal votes and discussions at the public meetings, the Committee found general support among the beekeepers for the programs, even though it was recognized by them that the industry's problems were not going to be solved in this manner. What beekeepers also sought were long-term, general solutions. These may include a comprehensive, ongoing program, such as the federal grains program, that could provide a safety net for the industry.

3.4.2 Long-term Programs

National Tripartite Stabilization Program (NTSP)

In May 1989, the Canadian and Albertan governments and industry made a ten-year commitment to participate in a tripartite stabilization program for honey designed to reduce the loss of income to beekeepers caused by market price fluctuation. Similar to other tripartite schemes, the program is based on the principles of:

- equal level of support across Canada
- voluntary participation of producers
- non-stimulation of production
- cost-sharing of premiums among the three partners.

Two-thirds of the contributing premiums are paid by the federal and provincial governments. The current support price mechanism is based on 90 percent of the previous 7-year indexed moving average price for bulk honey. The program is now operating on a current year basis ending on May 31 of each year. The National Committee announces the support price and the stabilization payment, if any, shortly after the end of each crop year. Final payments, if warranted, will be paid within 6 weeks of receipt of a verified report of honey sales from the provincial administrator.

Guaranteed Margin Approach

The price support currently offered by the program is based on the indexed moving average price over the previous seven years. The support level does not take into account changes in yield and/or cash costs of production. Thus the current support formula does not offer a safety net against sudden increases in cash costs.

During the developmental stages of the NTSP, the Alberta government, with support from the industry, recommended that a guaranteed margin mechanism be implemented. After the cost data from Alberta and Ontario were reviewed, it was agreed that more cost of production research is required before proceeding with that approach. It was also agreed that the NTSP make provision for substituting a guaranteed margin provided the fund remains self-sustaining.

In February 1990 the National Committee agreed to pursue the more responsive gross margin support price mechanism for honey. A full-time economist has now been hired to develop cost-of-production models.

Timing of Payments

Payments are now made at the time of delivery of honey; thus some payments are made before sales and others afterwards. Most beekeepers would prefer that payments be made on the date of sale.

International Trade Implications

Recently the U.S. Department of Commerce initiated a countervail duty case against the Pork NTSP. The argument used was that discretion had been applied in the application of the NTSP and hence it was trade-distorting. If this standard of review is applied, all tripartite programs, including that for honey, would be countervailable under U.S. trade law. However, this issue is being challenged by Canada through the Free Trade dispute settlement panel and also through GATT. A decision from both panels is expected in July 1990.

A system of classification of all agricultural programs is being developed by the Multilateral Trade Negotiations. Tripartite programs will probably be placed in the "amber" (permissible but actionable) category. This decision will be known in late 1990.

Advanced Payments for Crops Program

In the 1989 crop year, the federal government ceased covering the interest cost of its loan advances to agricultural commodity producers under the Advance Payments for Crops Act. This action had a significant impact on many beekeepers, according to the Alberta Honey Producers Co-operative Ltd.

Worker's Compensation Board Premium Rates

Many commercial beekeepers who employ seasonal workers participate in Workers' Compensation Insurance coverage. For some, this is a significant operating cost. Between 1987 and 1990, premium rates for the beekeeping industry increased over 60 percent:

1987	$2.40 per $100
1988	$2.52 per $100
1989	$3.15 per $100
1990	$3.94 per $100.

Canada-Alberta Hail and Crop Insurance

Because of the special nature of the beekeeping industry and the particular problems associated with it that make it different than all other insurable commodities, it would seem appropriate to seek input and/or representation from the beekeeping industry in establishing insurance rates, payments, regulations, and appeal procedures.

3.5 Debt Financing

Obtaining credit has traditionally been a problem for beekeepers because financial institutions favour land-based rather than equipment-based collateral. Beekeepers do not necessarily own their land base. Thus when equipment loses its value, loans become more expensive and difficult to obtain. In areas of the province where winter management of bees has been demonstrated to be profitable, bees are sometimes used as collateral. This has not been the case in the Peace River area.

The availability of credit is of great importance to the commercial honey producer. Unlike the case in most agricultural sectors, operating costs for this sector far exceed equipment costs.

Private lending institutions are not willing to accept risk. In recent years, risk in the beekeeping industry has appeared very high. To bring this risk down to a level that is acceptable to lending institutions, some type of program is needed that will provide a safety net for producers.

AADC offers a three-year Index Deferral Plan for beekeepers with AADC loans. Under this plan, up to 25 percent of any payments due can be deferred. The deferred amount is at 0 percent and will be repaid when the current price of honey is above the ten-year moving average (currently set at $0.537/lb). The average is updated annually on June 30.

4.0 MARKETING ISSUES

4.1 The Present Situation

Most of the honey produced in Alberta is surplus to provincial requirements. Canada itself is an exporter of honey, with a per capita consumption of honey equal to one of the highest rates in the world (0.8-0.9 kg per capita). Thus, growth in demand must come mainly from the development of new products and export markets.

The long-term success of the beekeeping industry will depend on sound marketing strategies. The industry has never had a formal strategy for market development. If it is to become self-reliant, development of such a strategy is imperative.

Being a net importer of honey, the U.S. has been a traditional market for Alberta honey. Although U.S. government support mechanisms introduced in the past few years have made importation of honey less attractive to U.S. packers.

The last several years have seen an increase in honey exports to the European Economic Community by Canadian suppliers, but the market has not been aggressively pursued.

Table 6. Canadian Honey Exports

(tonnes)

Country of destination	1984	1985	1986	1987	1988
U.S.	15,608	13,999	8,547	5,949	5,395
West Germany	1,644	1,401	1,234	1,627	3,064
U.K.	477	600	719	898	1,426
Japan	261	376	375	416	1,256
Sweden	51	68	—	—	1,133
France	279	348	375	801	892
Denmark	—	—	—	314	439
Netherlands	405	157	151	308	—
Other	166	329	442	590	603
TOTAL	18,891	17,278	11,843	10,903	14,208

— denotes unknown

source: official trade statistics of Canada and U.S. Agricultural Attache

4.2 Marketing Opportunities and Constraints

4.2.1 Opportunities

The present marketing system can be better organized and financed to pursue a number of marketing opportunities that exist for the industry, particularly taking into account the competitive advantages demonstrated by Canadian and Alberta honey.

Quality

Alberta produces some of the highest quality honey in the world, based on its flavour, low moisture content, light colour and fine texture. U.S. packers often blend the "Extra White" and "White" grades of Alberta honey with the less expensive, dark honeys from Central and South America and other exporting regions.

Alberta honey is purer than that produced in many other areas. This feature goes well with the healthful image of honey, "one of nature's purest foods," and presents opportunities for the organic food market and other markets for healthful foods. A natural sugar which is easily digested and assimilated, honey could also be used in the processing of foods for diabetics.

Production capability

Honey production per colony is extremely high in Alberta due to climatic and other natural factors and the availability of forage.

Opportunities for Market Expansion

Canadian honey has gained a very good reputation in the world market for its high quality. As a result, much could be done to expand overseas markets. Japan, Taiwan and Korea represent major potential markets for Alberta and Canadian honey.

Opportunities for New Products

There have been few changes in the use of honey in recent years from its traditional use as a spread, sweetener, and flavouring agent. Honey has been used by food processors in cereals, bread, muffins, graham wafers, candies, yogurt, and honey butter and by the pharmaceutical and cosmetic industry in cough drops, cough syrup, shampoos, cosmetics, and lotions.

Opportunities exist for growth in the industry through the development of new honey products, particularly value-added products such as honey fruit spreads, honey fruit drinks, flavoured honey, honey mustard, and similar items. New packaging, as well as new institutional, commercial and industrial uses, could be developed.

Opportunities for Other Products

The potential exists for exporting honeybees to Japan in the fall, when bees are needed for pollination of specialty fruits. At this time of year there is an excess of beestock in Alberta. Demand for Canadian beestock, including queen bees, may also grow with the spread of Africanized bees in the U.S.

Hive products such as beeswax, pollen, propolis, royal jelly, and bee venom, if produced in sufficient quantities, could also be commercialized.

4.2.2 Constraints

Grading system

The lack of an international grading system for honey causes considerable problems for Alberta producers. The North American grading system of "Water White," "Extra White", "White," "Golden" and "Dark" is not used in Europe, where floral source identification is required on the label. Pollen source identification is time-consuming and requires laboratory facilities. The Agriculture Canada laboratory in Calgary provides the only pollen identification service presently available in Alberta, and this is provided only to beekeepers with overseas honey contracts. Beekeepers have been requesting the establishment of a testing facility which will process any sample, regardless of its destination. This would allow the results to be compared to tests conducted on the same honey in Europe. In addition, a marketing strategy should strive to use the European system of grading to our advantage.

European standards also dictate that when canola pollen grains are present in certain amounts in clover honey, the honey may be downgraded to canola honey, which is not considered as desirable by Europeans. A limit should be established below which any pollen of a different type which is present cannot be used to determine the category of honey.

Production capability

The present variability of production in Alberta's commercial beekeeping industry increases the difficulty of developing and expanding markets. Until adequate sources of beestock are secured, the ability of the industry to meet long-term commitments to certain levels of production may be questioned.

Competition

Competition in U.S. markets is strong. The only honey products which have been introduced successfully in recent years are those which are unusual, competitively priced, and supported by adequate promotional efforts. Competition in world honey markets is also stiff. Product diversification is needed for these markets also.

Cost of Production

Being removed from population and industrial bases, Alberta beekeepers must pay higher transportation costs for shipping to market. This problem is increased by a scarcity of barrel containers and the amount of costly space which they take. A better design for bulk containers is needed to lower shipment costs.

Compared to other major honey-producing competitors in the western hemisphere, Alberta producers are at a disadvantage in having higher labour costs and higher sugar requirements for winter management. The relatively high price of sugar in recent years has exacerbated this disadvantage.

Shipping

Bulk containers used to ship honey overseas often vary considerably in appearance and exterior quality. Canadian honey is not identified by any distinguishing label on these containers. Development of high-quality bulk containers with distinctive logos and colors would improve the image and marketability of Canadian and Alberta honeys abroad.

4.3 Development of Marketing Strategies

Entering and maintaining markets in Canada and overseas would require a well-coordinated, well-focused, and well-financed effort. Development of a marketing strategy would require professional expertise and also the desire of beekeepers to cooperate. The situation at present is not conducive to implementation of an effective marketing effort. The producer segment has been focusing on maximum honey prices, while buyers and packers have sought low prices. No concerted effort has been made so far in reaching a middle ground where funds can be diverted towards marketing.

An industry-wide point of humour relates that if there are two beekeepers in a room, there will be three different opinions on any topic. This diversity of views and independence of action creates a serious constraint on marketing. If commercial producers do not agree to limit their independence for the common good of the industry, market expansion and stability will continue to elude them. To encourage broad support from the industry for marketing (as well as for research and development), government should consider program coverage for beekeeping participants in a check-off system such as that used in many agricultural sectors.

As the Canadian Honey Council represents the Canadian industry, it should spearhead market development. To date the Council has retained a professional position for its Marketing Committee; however, the mandate of this position has been limited so far to promotion. To initiate an effective marketing campaign, four key areas need to be addressed: promotion, product development, pricing, and distribution.

The initial focus of the strategy might be on generic promotion and product development. An Albertan or western Canadian marketing plan might be formulated similar to that of the Alberta Sheep and Wool Commission.

4.3.1 Market Financing

The primary element of a marketing strategy is financing. In the past, government funding for market development has been directed toward individual marketing efforts. The long-term support of marketing on a industry-wide basis will require the development of a fund-raising mechanism such as the formation of a commission or the collection of a voluntary levy, based on a unit of sale.

to assist with marketing programs. A much greater involvement will be needed from all segments of the industry - beekeepers, wholesalers and packers. Small producers who sell locally would be missed unless government programs can be linked to participation in the check-off.

A national fund collecting system would be preferred. This may be more readily achievable by first introducing a western or provincial system.

4.3.2 Domestic

Because of the nature of Canada's retail food market, new honey products are not easily introduced onto retail shelves. The industry should be aiming for domestic market expansion through new product development rather than expending effort in vying for limited shelf space among its own members.

New products and uses are being developed, for example, by the Alberta Honey Producer's Cooperative Ltd. with government funding assistance, but the process is slow and expensive.

The Canadian Honey Council is currently analysing trends within the domestic market. This information is an important first step in determining marketing and promotion efforts in the future.

4.3.3 Overseas

Future success will depend upon sound distribution agreements, which might include joint ventures, good pricing, efficiency and service. Meeting classification standards and importer's specifications will be essential. Assistance and expert advice on this could be obtained from government trade offices. However, the impetus and follow-up actions must come from the industry.

5.0 INITIAL ACTIONS TAKEN BY THE COMMITTEE

The Committee's initial task was to establish short- and long-term priorities. In its initial meetings, the Committee identified the following topics as important for investigation:

- Price of sugar/Alberta sugar sources
- Cash advances under the Advance Payment of Crops Act
- Price of honey and market development
- Tripartite Agreement payments to producers
- Queen bee importations from Hawaii
- Foreclosures of beekeeping operations
- Surplus equipment from closed operations
- Australia and New Zealand beestock sources
- Pesticides
- Diseases

Three of these topics - the price of sugar, importation of Hawaiian queen bees, and overdue Tripartite payments - were identified as being of immediate concern, since the problems of cashflow and low price of honey were disrupting operators' plans for overwinter management. This was seen as a serious problem in light of the declining colony numbers resulting from border closure. Hence the Committee began to monitor the Tripartite program and to develop a program to reduce the price of sugar.

In addition, because of the length of time needed to establish an assured source of high-quality honeybee queens, the Committee began to investigate how Hawaiian queens might be imported.

5.1 Sugar Price Reduction Program

Since the ban on importation of beestock, all beekeepers in Alberta have had to maintain colonies over the winter. This necessitates the purchase of large quantities of sugar in the fall to prepare colonies for winter. Thus the puchase of sugar has become a major operating cost.

Historically, sugar prices in Canada have been lower than those in most other countries. However, between 1988 and 1989, sugar prices in Alberta increased by approximately 20 percent. To address this problem, the Committee recommended that the Minister start an assistance program to reduce the cost of sugar used for overwinter management. The proposed Sugar Price Reduction Program was submitted to the Minister for consideration in September and announced in October 1989.

Under the program, Alberta Agriculture will grant to registered Alberta beekeepers up to $3 per 40 kg bag of sugar or equivalent. The sugar must be purchased between August 1, 1989 and May 31, 1990 and must be used for overwinter management and spring feeding of honeybees. Payment will be based on the number of colonies registered in 1989. The program is expected to cost less than $500,000.

Before Alberta could implement the Sugar Price Reduction Program, an amendment to the National Tripartite Stabilization Program had to be signed, as Section 1.0 (a) of the Program prohibits provinces from providing ad hoc assistance to producers. After discussing this problem thoroughly with industry and government, the Committee concluded that the amendment should be signed for the following reasons:

- The problem of cash flow and sugar prices for some beekeepers was urgent;
- Alberta would probably be required to sign the amendment in the long term;

- NSTP payments to Alberta would be processed;
- The Government of Alberta's central objection (namely, the level of 'top loading') could be negotiated later.

5.2 National Tripartite Stabilization Program Payments

The first payment period under the National Tripartite Stabilization Program for marketed honey was 1 June 1988 to 31 May 1989. Alberta was the first province to have its contributions in place. However, payments for this period were expected to be late because of start-up delays. The Committee recommended to the Minister that he urge the federal government to make timely payment. However, due to start-up delays, Alberta beekeepers did not receive payments until November.

5.3 Action on Importation of Honeybee Queens from Hawaii

The Beekeeping Industry Advisory Committee reviewed the arguments for and against allowing importation of honeybee queens from Hawaii (see Chapter 2) and concluded that there were no reasonable technical or scientific arguments for prohibiting the importation of queen bees from Hawaii to Alberta and advised the Minister to continue to seek federal approval to import honeybee queens from Hawaii.

The Minister communicated with the Federal Minister of Agriculture on a number of occasions to urge reconsideration of this issue. No positive response has been received to date.

6.0 SUMMARY OF PUBLIC MEETINGS

The Committee held public meetings with beekeepers in three different regions of the province, represented by Brooks, Edmonton, and Girouxville. General topics which beekeepers were invited to address were suggested in the notices of meeting published in newspapers and newsletters in advance of the meetings.

Each meeting followed a similar agenda. After an introduction and explanation of the advisory mandate of the Committee by the Chairman, attendees presented their oral and written submissions. These were followed by a general discussion about the topics raised in the submissions. A more structured general discussion on the major issues was then led by the Committee. In attempting to gain a better understanding of the views of the beekeepers in each area, informal votes on certain key topics were taken at the end of the general discussion.

The written briefs submitted at these meetings and those sent in after the meetings were used by the Committee in its subsequent deliberations. All written briefs were given to the Minister.

6.1 BROOKS

The meeting at Brooks was held at the Provincial Building on December 4, 1989. Fourteen beekeepers attended. One written brief was submitted and a number of oral briefs were presented, followed by an informal discussion of the points raised. In this session and the afternoon's general discussion, beekeepers raised the following ideas and issues:

a) Production

- problems with Australian and New Zealand honeybee queens
- opening the border to Hawaii if mite-free bees can be guaranteed
- purchasing of bee packages from within Alberta
- problems with roadside spraying
- need for earlier pesticide notification by applicators

b) Economic

- price of sugar
- WCB premium rates
- debt financing
- AADC loan policies
- dealing with empty hives

c) R&D

- research needs regarding tracheal mite control
- government-producer cost-sharing of mite testing program
- need for re-instatement of provincial apiculture newsletter

d) Marketing

- need for a professional honey marketing survey and overall strategy

6.2 EDMONTON

The public meeting, which took place on December 5 in the J.G. O'Donoghue Building, was attended by 32 beekeepers. Four written briefs were submitted, followed by a number of oral briefs and discussion of topics. Topics and ideas raised at this session and the afternoon's discussion were:

a) Production

- poor quality of queen bees from Australia
- importation of queen bees from Hawaii
- need for more queen bee production in Canada
- hired help in the industry
- need for some control on pesticide application, including mosquito control and roadside spraying
- movement of infested colonies within the province

b) Economics

- debt financing, including AADC policy, high interest rates, and low appraisal value of beekeeping equipment by lenders
- ineligibility of some beekeepers for sugar subsidy program
- need for a government loan guarantee program

c) R & D

- direct research toward applied rather than pure research pertinent to the beekeeping industry
- need for more testing for mites and detection facilities for beekeepers
- need for registered acaricides
- need for government research on safe acaricide application methods
- re-instatement of Alberta Apiculture Newsletter
- distribution of completed apiculture research reports to beekeepers
- availability of testing results for operators selling bees

d) Marketing

- difficulty of obtaining shelf space for new honey products
- need for beekeepers to work together to promote honey consumption
- uncontrolled cost of listing a new product

6.3 GIROUXVILLE

The public meeting at Girouxville was held on 6 December at the Senior Citizens' Drop-In Centre and was attended by 50 persons. Thirty-four briefs were presented, 30 of which were written. As more time was spent on the submissions at this meeting, less time was available for discussion afterwards.

Most briefs were from commercial beekeepers who operated several hundred to several thousand hives prior to the fall of 1987. Two briefs were submitted by out-of-province beekeepers. In addition, a village mayor and representative of a regional economic development organization presented submissions.

Issues raised were:

a) Production

- effects of border closure
- problems with honeybee queens from Australia and New Zealand, including poor quality, high cost, aggressiveness
- high mortality of wintered bees
- lack of available supply of early queens from B.C.

- poor quality of beestock from B.C.
- hostility from B.C. toward wintering Alberta bees
- Hawaii as a source of queen bees
- opening U.S. border to certified U.S. bees
- roadside spraying

b) Economics

- bankruptcy
- loss of revenue
- cash flow problems
- debt financing, including possibility of government guarantee on loans or rollover of loans to AADC
- possible federal government compensation
- honey subsidy of U.S.
- devaluation of equipment
- AADC policy
- administration of Tripartite stabilization payments
- sugar price reduction program
- dealing with surplus hive situation
- Advance Payment for Crops program

c) Research and Development

- need for registration of mite control chemicals
- allowing mite control chemicals in imported packages
- need for testing program for mites
- the European experience with varroa mite
- need for technical quarterly report for beekeepers
- extension on raising honeybee queens

d) Marketing

- increasing demand for disease-free bees
- commission with refundable check-off
- need for professional assessment of honey marketing
- packing and grading by recognized packers only
- need for government assistance in shipping
- promotion of Alberta honey through trade missions
- western representation on Canadian Honey Council